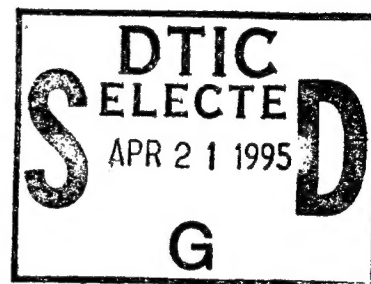
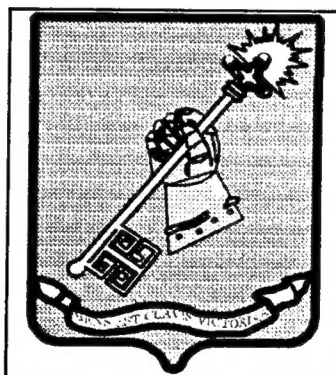


THE FINAL ASSAULT:
A DOCTRINAL ANALYSIS OF ACTIONS
ON THE OBJECTIVE

A Monograph
by

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Armor



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Actions on the Objective

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ABSTRACT

THE FINAL ASSAULT: A DOCTRINAL ANALYSIS OF ACTIONS ON THE OBJECTIVE by MAJ Stuart A. Whitehead, USA, 65 pages.

This monograph addresses whether current doctrine adequately prepares armor and mechanized infantry forces to successfully conduct the final assault of a prepared position. Offensive operations culminate with actions on the objective, yet observations from the US Army Combat Training Centers suggest that, as a rule, heavy battalion/ task forces are frequently unable to accomplish this critical task. To identify threads of continuity, this monograph researches the origins of assault theory, and traces both the historical and contemporary application assault doctrine. The research findings are compared to current doctrine and suggest implications for future doctrinal development and training.

This monograph first examines the theoretical foundation of assault theory. Drawing from a wide variety of theorists, who's contributions extend from ancient times to the present, their ideas yield valuable principles which transcend, time, culture and technology. These principles represent a point of departure for the subsequent historical analysis of actions on the objective. Beginning with World War I and extending to Desert Storm, military history is analyzed to discover new ideas, and confirm or deny those theoretical precepts identified by the theoretical research. Contemporary experiences of heavy unit training at the US Army's Combat Training Centers complete the analysis.

This monograph identifies seven "threads of continuity" which embody a synthesis of analysis, observation and experience concerning the final assault. When compared to current assault doctrine, these "threads" suggest that our doctrine is solid. Three additional considerations, however, may be useful in developing future assault doctrine; they include: pivots of maneuver, relative power and exhaustion. Finally, this monograph's methodology and findings are considered in light of their implications for training and preparation for future war. In this regard, "the final assault" is representative of doctrine's greater role, that of providing a common vocabulary, a "way to think" and a rational basis for "not getting it too wrong" before entering combat.

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*Invincibility lies in the defense; the possibility of victory in the attack.*¹
Sun Tzu

I. INTRODUCTION

In 1944, the "ultimate objective of all military operations... [was] the destruction of the enemy's armed forces in battle. Objectives could be attained by maneuver alone; ordinarily... [however, they were] gained by battle."² Today our doctrine states, "the purpose of the *attack* is to defeat, destroy, or neutralize the enemy. Success... depends on the skillful massing of effects against the enemy force. The objective is to shatter the enemy's will, disrupt his synchronization, and destroy his units' cohesion and the willingness of his soldiers to fight... leave[ing] defending units incapable of further resistance."³

Our current war fighting approach clearly holds great stock in the psychological and physical effects of fire power. Indeed, our experiences in Desert Storm seem to validate this very notion. Yet it is arguable that the outcome may have been different against a more professional, better equipped, trained and determined force. Future conflicts may find our mechanized forces deployed in areas of "close" terrain and severe cloud cover against a well equipped, battle hardened opponent. The purpose of this monograph is to investigate if our current doctrine is up to the challenge; whether it provides our armor and mechanized infantry commanders with the tools they need to conduct a successful final assault against a prepared enemy defensive position.

As America's warfighting doctrine evolved over the past 50 years, the Army maintained that decision by combat required the destruction or submission of the enemy. "To close with and destroy the enemy" remained the aim of our combat arms and to the

degree that this could be accomplished with minimum loss of life was every commander's goal. Yet in conducting offensive training, our Army seems lacking in this critical skill: actions on the objective. Units at home station rarely practice fighting through a deliberate enemy defense, in fact environmental constraints frequently disallow the construction of field fortifications.⁴ As a result, Pyrrhic Combat Training Center (CTC) victories typified by a lone surviving vehicle assaulting an objective are more often the rule than planned, rehearsed and boldly executed battalion assaults.⁵ If as Michael Howard suggests, the responsibility of a peace time army is not to "get it too wrong," then we must revisit this critical task.⁶

In the event that we may one day be called upon to fight an opponent on more equal footing, our army must know how to close with and destroy the enemy. This monograph represents the first step in that process and will answer the following questions: Is our assault doctrine complete and consistent? Does it provide our commanders the tools they need to plan, prepare and execute the final assault? What are the implications for future doctrine and the way we train?

The monograph's initial focus centers on the nature and purpose of both the offense and defense. It examines how the two phenomena interact and attempts to achieve an understanding of the resultant outcome. The sources for this study include the writings of Sun Tzu, Clausewitz, Jomini, and Fuller. Additionally, by understanding the relationship and purpose of the objective to this interaction, the research will yield theoretical precepts germane to success in "the assault." This material will serve as a comparison to current

doctrine's "offensive fundamentals." Having confirmed or denied "the assault's" theoretical foundation to doctrine, we will investigate historical evidence of doctrinal application.

By organizing material chronologically, the research will follow the evolution and application of Army doctrine compared to contemporary accounts of its effectiveness in combat. In particular, by focusing on each "formation's" inherent responsibility in the assault, we will reveal "lessons learned" for comparison to later doctrine. For example, the first analysis will focus on World War I. As trench lines remain an integral element of modern defensive positions, a clear understanding of trench operations is implicit in an understanding of the overall assault. How were the "lessons learned" of trench warfare incorporated into 1941 and subsequent doctrine? Have some of these concepts fallen by the way side in the advent of mechanized warfare? Do they remain applicable?

World War II is the departure point for analyzing the *mechanized* assault. Despite improvements in equipment capability, weapon's range and lethality, nearly all of today's systems descend from a WW II predecessor. This similarity of systems, combined with our combat experiences and those of other nations, constitute the weightiest portion of evidence from which we will extract doctrinal summaries. This information will serve as an intermediate point of comparison, bridging the gap from WWI to the present.

Lastly, through interviews and research, we will examine the experiences of the CTCs and the Gulf War to capture a contemporary perspective of assault doctrine. By comparing these results to the theoretical and historical findings, we shall determine the validity (or degree of validity) and completeness of contemporary final assault doctrine. From this research we will explore the implications to future doctrine and training.

Theory leaves it to the military leader...to act according to his own courage, according to his spirit of enterprise, and his self confidence. ⁷

Clausewitz

II. DEVELOPMENT OF THE THEORY OF THE ASSAULT

The Offense.

Sun Tzu begins The Art of War's third chapter, "Offensive Strategy," with the surprising statement that "the best policy is to take a state intact...To subdue the enemy without fighting is the acme of skill."⁸ Herein lies what Clausewitz describes as the objective or *end* of the attack, namely national conquest.⁹ While both men agree that the objective size may extend from "an insignificant hamlet" to a "whole country," their separate perspectives suggest a difference in *ways*. Sun Tzu, taking a broader view, identifies four "policies" in order of merit: attack the enemy's strategy, disrupt his alliances, attack his army and lastly, his cities.¹⁰ Clausewitz's narrower focus centers on the destruction of the enemy's fighting forces.¹¹ Taken together, both men recognize that friction is a condition inherent in all levels of war and each presents ways by which generals may minimize friction's impact upon the offensive operations.¹²

With the understanding that war is dynamic, Sun Tzu rationally examines and appraises relative power through the use of "five fundamental factors."¹³ These individual factors may gain or lose importance with each situation but always retain a relationship to each other. As a result, his plans pit strength against weakness, suggesting that an army will sustain an attack "without suffering defeat" through the use of *extraordinary* (ch'i) and *normal* (cheng) forces. Evoking a Taoist water metaphor,¹⁴ Sun Tzu explains: the army "fight[s] with the effect of pent up waters which, suddenly released, plunge into a bottomless abyss,"¹⁵ the normal force fixing the opponent while the extraordinary forces

take the path of least resistance (what Liddel Hart describes as the indirect approach¹⁶) to attack the enemy from a vulnerable flank or rear. As the forces progress through the depth of the enemy the cheng force may discover success while the ch'i experiences resistance; thus exchanging roles. This fluid shifting of main and supporting effort throughout the conduct of the attack is the foundation for the contemporary concepts of the "expanding torrent" or "surfaces and gaps."¹⁷ It is reflected in the way that the US Army selects, maintains and changes main and supporting efforts during the conduct of an attack.

"The attack erupts in a powerful and violent *assault* upon the objective. Its purpose is to destroy an enemy force or to seize the ground it occupies. Agile units are prepared to shift the main effort as conditions unfold."¹⁸

Clausewitz viewed the destruction of the enemy's fighting forces as the *means* to achieve the *end*: subjugation of the enemy, which in turn leads to the *objective*: conquest of territory.¹⁹ In execution, the attack (*offensive thrust*) is "an action...complete in itself"²⁰ performed by the means available, specifically and limited to "the fighting forces."²¹ Herein lies the aggressor's challenge, the retention of forward momentum while his force diminishes; put differently, an attacker must cause the defender to culminate first while retaining sufficient forces to consolidate gains and defend from counterattack.²²

To overcome this friction, Clausewitz suggests a "reverse planning" approach by reminding us that "the object of the attack usually gains significance only with victory... So the attacker is not interested simply in reaching the objective: he must get there as victor."²³ The end state (the posture required to assume subsequent operations) "indicate[s] the natural direction of the blow."²⁴ The *aim* of the commander is to seek an "expeditious decision," but tempered so as to avoid hasty and wasteful actions.²⁵ Like Sun Tzu, Clausewitz maintains that the attack must bypass strength and concentrate on

weakness: the enemy's lines of communications, flank and rear. Yet Clausewitz also warns that as the attack draws to completion and goes over to the defense an "attacker's rear [becomes] inherently more vulnerable than the defender's."²⁶

The Defense.

Of the defense, Sun Tzu is more sparing of analysis. Yet, he clearly recognized the singular importance which the defense played as a point of departure for all subsequent operations.²⁷ Perhaps more importantly, we see the emergence of the *offensive defense*, the idea that from a defensive posture the defender waits for the attacker to reveal a vulnerability then counterattacks.²⁸ This concept resonates throughout the ages. Clausewitz described the defense as a "shield of well-directed blows."²⁹ Jomini exclaimed: "The best thing for an army on the defensive is to know *how* to take the offensive at a proper time, and *to take it*."³⁰ More recently J. F. C. Fuller stated that "the defensive is but a suspended state of the offence...and should be so organized as to permit of it changing into an offensive at the shortest possible notice."³¹ Herein lies the paradox or, as Clausewitz suggests, the dual nature of the defense.

Fuller continues, however, that the object of the defense is the preservation of combat power so that "*we may more economically destroy the enemy's strength*."³² It is this salient point which Clausewitz describes as the defense's *passive purpose*, "preservation," and *active purpose*, "conquest."³³ Both ideas are manifest in time and space. "Time which is allowed to pass unused accumulates to the credit of the defender...Any omission of attack-whether from bad judgment, fear, or indolence-accrues to the defender's benefit."³⁴ Space is the area in which the defender may conduct his operations. Therefore, while a

defender "awaits the blow" he uses space to protect the force, until he achieves "a more favorable balance of strength," whereupon the "negative object" of the defense is abandoned in favor of the "positive object," the offense.³⁵ This concept is captured in Army doctrine where "forces defend only until they gain sufficient strength to attack."³⁶

Offensive and Defensive Interface.

Military theorist, Dr. James Schneider³⁷ suggests that the relationship between offense and defense is relative. First, an engagement is unlikely to occur without the consent of both belligerents. "The decision to retain an objective gives rise to the defense. The decision to seize an objective gives rise to the attack."³⁸ The interaction of these two forces, therefore is measured in relation to each other. The attacker seeks to seize the objective by overcoming the defender's "inertia resistance" while the defender attempts to "exhaust the attacker's combat power." The degree to which one force is successful over the other is measured *relative* to the strength of the other. Fuller summed up this relationship: "If men are squandered in attempting to avoid blows they will not be in a position to give them, and, not giving them, they allow their enemy to reduce his defensive strength to a minimum and to increase his striking power in proportion."³⁹

The key to success for both the attacker and defender is to accurately assess his own strength and position relative to the opponent's. To this end, the Jominian concept of pivots of maneuver is useful⁴⁰ as the seizure of these points results in the cumulative effect of "imposing a continuous decision upon the defender."⁴¹ The successful attacker carefully selects the appropriate pivots of maneuver, while the defender considers them as a priority for protection; shielding other locations through an economy of force. A second

associated concept is *freedom of action*. The speed at which either the attacker or defender anticipates or responds to the actions of the other will severely impact upon the success or failure achieved at a pivot of maneuver.⁴² Therefore, the attacker may attempt to deceive or paralyze the defender ensuring freedom of action and momentum along his line of operations. Conversely, the defender will attempt to slow or deny the attacker's actions, for example, through the use of deception and counterstroke. The measure of success is found by examining at a given point in time, both the speed and depth of the attack plus, the ability of the attacker to sustain his forward momentum, balanced against the defender's ability to continue to resist or counterattack.

The critical decision which a commander must make, once he judges that his offensive momentum is slowing, is when and where to commit his reserves. This is the one way in which he can directly influence the outcome of combat. A reserve, however, is limited by its size, organization and distance to the designated objective area. As a rule, the reserve adds momentum to the attack by seizing pivots of maneuver, breaking through and exploiting success, or blocking enemy counterattacks.⁴³ The reserve is also limited in that it is usually used but once. Therefore, the commander must *accurately* assess the situation, and direct his reserve's commitment so that it reaches the desired location at the most opportune time and in a posture which allows for maximum shock effect. Culmination occurs, if after committing the reserve, the attacker no longer retains sufficient combat power to maintain momentum, seize the objective or repel the counterattack. Similarly, the defender culminates when he is no longer capable of resisting the aggressor.⁴⁴

The Objective.

"A position is not in itself an objective to be gained, but only so in relationship to the ultimate object. The seizing of a position may be a means of defeating an enemy, or the defeat of the enemy may be a means of occupying a position; they are, in fact, relative objectives...a plan...demands a definite object which should never be lost sight of, and this object, in its turn, demands a series of moves each demanding an objective of its own."⁴⁵

Thus, Fuller captures the essence of the tactical objective. While ultimately "to close with and destroy the enemy" remains the battle cry of combat arms, the final action on the objective embodies both the physical and moral dimension of war.

In selecting an objective the commander is limited by what his force is physically and morally able to accomplish. Physically the objective is, as Fuller describes, either terrain or enemy oriented. However, in seeking mission accomplishment, the commander returns to the Jominian approach of seeking a *line of operation*. He orients upon a series of pivots of maneuver or intermediate objectives, while heeding Fuller's advice that "the most apparent line of approach is not necessarily the line of least resistance."⁴⁶

The moral domain, as one would expect, is more difficult to define. James Schneider views it as "concerned with the disintegration and breakdown of will."⁴⁷ These sentiments are reinforced by S.L.A. Marshall's research concerning combat motivation and unit cohesion, where his ultimate findings can be reduced to: move, shoot and communicate!⁴⁸ So it is that as a unit assaults an objective it experiences counterpressure within two domains: the cybernetic and moral.

The nature of the empty battlefield,⁴⁹ enemy obstacles and defensive use of terrain in depth portray an objective which requires a combination of centralized and decentralized execution of offensive operations in breadth and depth. As the unit is exposed to attrition by fire and separation through tactics and battlefield effects, the moral glue that ensures

unit cohesion includes forward momentum, communication and firepower.⁵⁰ The resiliency of the unit as it suffers attrition depends on morale, discipline and leadership.⁵¹ Attrition over time, however, will cause even the best units to undergo disorganization and possibly disintegration.⁵² The key for commanders leading an assault is to ensure that the unit remains cohesive throughout the duration of the operation, while at the same time expediting the enemy's disintegration.

The objective therefore becomes a proving ground between offensive and defensive plans. By its selection, the objective determines where the decision by combat will occur and under what conditions. Whether identified as a pivot of maneuver for a larger operation or the final objective in its own right, the objective is the point of decision. The assault's outcome facilitates, hinders or denies subsequent operations. It is through the clash of two forces that combat assumes a third quality. The duration of the action and the *relative* losses between belligerents reshape future combat. Here actions on the objective reflect less the "expanding torrent" rather, an "ebb and flow" of smaller actions within the context of the broader operation.⁵³ To the degree that one force prevails over another, the impact of the decision will be greater. It is with this understanding that our thoughts now turn to the conduct of the assault and the doctrinal underpinnings which shape both our thinking and our operations.

A Summary of Assault Theory.

The review of "assault theory" yields valuable principles which appear to transcend time, culture and technology. The aggressor has the initiative by choosing the time and place of attack, often incorporating surprise and deception. The line of operations he

chooses follows pivots of maneuver, which lead to the defender's culmination. The aggressor's main effort will shift to follow the path of least resistance, often seeking an indirect approach to exploit enemy weakness and massing combat power upon decisive points. During his maneuver, the attacker's security lessens as his momentum slows or upon assuming a defensive posture. The attacker must continually gauge his capabilities and combat power against the enemy's ability to resist. He must also maneuver with sufficient speed to paralyze or preclude the defender's actions. When necessary, the commander may influence actions on the objective through the commitment of the reserve. Success is measured by the unit's completion of the mission with both the combat strength and disposition to accomplish intended subsequent operations.

In comparison, current US Army doctrine describes the assault as: "the culmination of an attack which closes with the enemy."⁵⁴ A more descriptive definition is found in FM 100-5 under the heading: "close operations."

"Close operations are when soldiers close with and destroy the enemy. Close combat is normally required for decisive and lasting effects on the battlefield. It is also the type of combat that places soldiers at greatest risk. Close operations are the activities of the main and supporting efforts around or through enemy defenses to occupy objectives that permit the defeat of defending forces."⁵⁵

Although US Army manuals do not address the theory behind the doctrine, we do gain some insight through an understanding of principles, tenants, imperatives and characteristics. As an example, the characteristics of offensive operations: surprise, concentration, tempo and audacity are consistent with our theoretical investigation.⁵⁶

However, the description of assault execution varies from the theoretical analysis.

An analysis of the FM 100-5 narrative "Conducting Attacks" yields ten aspects of the assault.⁵⁷ Of significance is the absence of "pivots of maneuver" or like concepts, a

discussion of diminishing combat power or the necessity to gauge friendly strength against enemy ability to resist. What in fact the doctrine does describe is the application of firepower, a lethal, blunt instrument used to prepare and paralyze the enemy, but it lacks direction once the objective is reached. To offer an analogy inspired by James Schneider, as the broad brushes used by an artist to prepare the canvas are inappropriate for portrait detail, so too, is the fire power used to prepare and isolate the objective inappropriate to fight through and clear the same.

Subsequent sections of this monograph will address the historical and contemporary experiences of units called upon to execute actions on the objective. This analysis will yield "discovered" principles which may validate, discount or add to the theoretical foundation of this crucial operation. As is already apparent, current doctrine is perhaps at least guilty of omission in its discussion of the assault. However, it remains to be seen if the historical research, in fact, bears this out. In the interim, it is important to remember that there is a *difference* in the theory considered germane to the assault.

The analysis begins with World War I. "The Great War" offers piercing insights into the modern battlefield. In particular, trench fighting, the heavy reliance on infantry and superiority of fire power which typified WWI, remain significant elements of modern assault conditions. Junior leaders in the war learned to adapt and overcome the machine gun and howitzer to break the tactical stalemate and return maneuver to warfare. Section III begins with their experiences and captures their lessons learned. These lessons would be a legacy for their sons who would also find themselves fighting "over there."

*...to succeed we must go fast and to go fast we must go where the going is good.*⁵⁸

Infantry in Battle

III. HISTORICAL ANALYSIS OF THE ASSAULT

World War I

In 1914, M. Jean de Bloch applied deductive reasoning and analogy to the quantitative analysis of weapons improvement. His seminal work, The Future of War, forecasts implications for war from the tactical to the strategic level. Citing four revolutionary changes in firearms, Bloch predicted technology's impact upon modern combat: vastness of the battlefield, attacking entrenched positions, massed attacks, duration of battles, pursuit and lack of combat decision.⁵⁹ His prescience, however failed to deter Europe from undertaking its costliest war.

Among the many reasons for the tactical impasse experienced by forces on the Western Front, of significance was the misunderstanding of lessons learned from the Russo-Japanese War. As an example, in 1912, French Major de Pardieu authored A Critical Study of German Tactics and of The New German Regulations.⁶⁰

"Before the Russo-Japanese war the Germans used to believe that fire action would be sufficient to overcome the resistance of the enemy; the assault was to take place only to crown a victory already acquired. War has shown that if fire action is necessary in preparation, the attack can nevertheless be made successful only by a hand to hand combat. The bayonet has retaken the very important place which had been refused to it.

The Germans have taken this into consideration; we have said that the French should rejoice because of it."⁶¹

Indeed, the French did. Colonel de Grandmaison, chief of the operations branch of the general staff remarked, "In the offensive, imprudence is the best safeguard. The least caution destroys all its efficiency."⁶² As a result, the French, along the rest of Europe's armies, entered a war in which élan and "pro patria" Zeitgeist were soon halted by the

pitiless rattle of the machine gun. The lessons each army were to learn would be costly, yet they serve as the foundation for our analysis of modern warfare's assault tactics.

Prior to the war revised German regulations recognized the necessity of fire and maneuver to achieve success on the objective. The duty of the artillery was to prep the assault by concentrating fires upon the point of "decisive attack." By accompanying the infantry, artillery would support at close range, reduce supporting enemy positions and destroy obstacles.⁶³ At a distance of 100 meters (amended from 150 meters in 1909) the assault would commence by order of officers to the rear of the assault echelon.⁶⁴ However, the reality both sides experienced was that "during the first year of the war, attacks had almost always to be made without sufficient artillery preparation."⁶⁵

Over time armies "learned that the only method of delivering an infantry attack against a prepared position [was through]...a hammering with shells."⁶⁶ More to the point, "in order to attack with minimum loss" the artillery preparation must:

- (a) Destroy the wire entanglements.*
- (b) Neutralize or destroy the defenders of the trenches.*
- (c) Prevent the artillery from coming into action.*
- (d) Prevent the bringing up of reserves.*
- (e) Destroy the machine guns as soon as they reveal their positions.⁶⁷*

In addition to the artillery preparation and subsequent "creeping barrage," a machine-gun creeping barrage directed ahead of the first assault wave further ensured the suppression of enemy fighting positions and isolated the area from reinforcement.⁶⁸ Out of this has grown the following modern concepts: pre-breaching to facilitate maneuver, suppressing enemy direct and indirect fires and isolating the objective from enemy observation and reinforcement.

In World War I, assault tactics were designed to penetrate the enemy's defensive line, to create a gap which reserve forces could exploit. As the war continued enemy positions on both sides consisted of a series of defensive lines prepared in depth. Therefore, to create a gap the following forces were necessary:

(a) A first line of attack composed of several waves of assault with (as an element of preparation) a formidable artillery (field, heavy and torpedo guns) minutely regulated.

(b) A second line of attack as strong as the first, except perhaps in front of the centers of resistance, sent straight to the front all in one piece exactly like the first line....

(c) A reserve...destined to reinforce any point and conquer any irreducible or hindering resistance.

(d) ...Large units, ready to commence new combats...-Do not, after the hole has been pierced, depend any longer upon the regiments who made it.⁶⁹

Frequently, the German main line of resistance was found between the third and the fifth trench.⁷⁰ Before assaulting the main defensive line, units would halt at their "first objective" while artillery continued to prep the objective area. Once the assault commenced the first wave would assault the objective, while the second wave would pass forward to exploit. It is during this phase of the operation that the assault takes on the attributes of the "expanding torrent."⁷¹ Upon reaching the objective enemy communications trenches were "effectively barricaded" in case of counter-attack,⁷² patrols were sent out to establish contact with the enemy and to provide security for the assault force while obstacles were quickly established.⁷³

The technique was moderately successful but "a close run thing." It relied on the ability of the artillery to suppress the enemy, breach obstacles and protect the assault forces until their arrival on the objective. Should the artillery fail in any of these tasks, or if the assault speed became desynchronized from its creeping fire support, the assault wave would sustain heavy enemy counterfire and usually fail to reach its assigned objective.

Moreover, command and control between the assault force and the artillery frequently relied on "scheduled fires" and therefore could not be responsive to the needs of the assault force. It was not until the French counter-offensive at Verdun that both Allied and German forces organized their platoons with "riflemen, bombers, auto riflemen and rifle grenadiers."⁷⁴ This innovation became the genesis for "soft-spot" or "Hutier" tactics,⁷⁵ a solution to tactical impasse, but one which had arrived too late to salvage years of waste.

The Inter-war Years and World War II

In the years following World War I, military professionals were committed to learning *why* the carnage and senseless slaughter occurred and *how* to prevent similar experiences in the future.⁷⁶ One of the most influential critics was CPT Liddel Hart. In A Science of Infantry Tactics Simplified, Hart attempted to provide a theoretical foundation for tactics based on a set of principles designed by COL J.F.C. Fuller.⁷⁷ In essence, Hart reduced the fight (seen as an economy of force) to its three "constituent elements:" hitting, guarding and movement.⁷⁸ By way of analogy he described the attack as "The Man Fighting In The Dark,"⁷⁹ using the actions of an individual combatant to illustrate the execution of his principles. This approach is useful to ensure that each element of an operation has a *purpose* which can translate directly into a tactical task.

The American experience, in sharp contrast to the British perspective, yielded an unsurprisingly pragmatic perspective of tactics. While considered useful, "Principles" took a back seat to experience and improvisation:

"One writer has stated that 'the principles of the art of war are enunciated in order that we may understand the risk that we take in violating them.' To this we may add that a smashing of rules and a violation of precedent is in itself an important principle in the art of war."⁸⁰

Beyond the irreverence, however, rests a very detailed discussion by Bond and Crouch entitled "General Problems of the Attack." The critique encompassed fourteen points of discussion, first summarized, then each addressed in detail.⁸¹ The observations and findings of these officers bears striking similarity to many of the principles, tactics, techniques and procedures reflected in our modern tactical manuals. As an example, a significant portion of their work is embodied by the Army's acronym SOSR (suppress, obscure, secure, reduce).⁸² However, a new age in warfare was about to dawn and the application of the principles of "hitting" and "movement" would take on a new dimension.

The Offense.

In his famous book Attack: A Study of Blitzkrieg Tactics F. O. Miksche suggested that three factors "formed the basis for offensive action...surprise, speed and superiority in material or fire-power."⁸³ This "new character of war" was manifest through "motorization as method of transport, mechanization as method of breakthrough, air action as [a] method of support, protection and communication."⁸⁴ The failure of the Schlieffen plan in 1914 and the subsequent tactical stalemate along the enormous western front led the Germans to conclude that "no modern army has open undefended flanks." Therefore, to succeed an attacker must create a flank by way of penetration. However, to accomplish the penetration, the attacker must first *identify* a weak point in the enemy's defenses and then *concentrate* "overwhelming force at this weak point." Miksche concludes that the combination of "search for the weak point and concentration...[were] the chief characteristics of modern German methods."⁸⁵

In practice the execution of this concept relied on two techniques: *Schwerpunkt* and *Aufrollen*, concepts which essentially formalized the tactical execution of Liddell Hart's "expanding torrent."⁸⁶ When combined with "search and concentration" we also arrive at the tactic known as *Flaechen und Lueckentaktik* (surfaces and gaps).⁸⁷ However, it was not until this concept was married with the tank, that Europe would feel the true effects of the Blitzkrieg. By recognizing that the tank's primary value lay in its speed and that fire power facilitated its movement through resistance, the Germans discovered the key to creating a penetration of enemy defenses and built their tactics around it.⁸⁸ As a result, *Panzer divisions* maneuvered in a "block formation" which had several advantages:⁸⁹

1. Tank concentration allowed for concentration of fire power forward and limited the number of targets susceptible to anti-tank fire.
2. Compact formations are less observable by land and air reconnaissance.
3. Supporting arms (artillery and air defense artillery) find it easier to protect a compact formation and provide massed weapons effects at the point of penetration.
4. Tight formations enhance maneuverability.

The Defense

The Blitzkrieg, however, was not infallible and in 1943 the Soviet Army executed Mikche's solution in the defense of the Kursk Bridgehead. Miksche recognized several weaknesses in the German tactic. First, not all the Wehrmacht was mechanized, therefore the first aim was to separate the mechanized forces from the non-mechanized forces and the service support units which followed them.⁹⁰ Second, the defense must offer resistance in *time*, based on proper use of terrain (islands of resistance⁹¹ in tank proof country),

maximizing the use of obstacles, covered by direct and indirect fire and linked to counterattack plans at each echelon.⁹² Thus a defense in depth resembles a "filter" that allows some units to pass (at a cost) while fixing others, at the same time channeling the attacking force until it is vulnerable to counterattack and destruction.⁹³ The advantages to this system of "web defense" and "counterattack" include:⁹⁴

1. Elements of the defensive system can continue to fight, even when surrounded.
2. The attacker's fire is dispersed in time and space and is therefore less effective.
3. It allows the defender to better use the terrain to advantage, including concealment.
4. The attacker is vulnerable to fires: forward, flank and in depth.

Following the war, the Red Army General Staff directorate for studying war experience described the principle feature of the Kursk defense:

" Our defense of the Kursk bridgehead had the aim of exhausting and bleeding dry the enemy's enormous advancing forces, so as to shift subsequently to a decisive offensive by introducing fresh reserves. "⁹⁵

Their "general conclusions" also outlined these following defensive characteristics:⁹⁶

1. "Great depth" (up to 110 km along the enemy main direction of attack) with up to four defensive positions forward of Kursk to a further depth of 60 km.
2. "Defense stability and dynamism" through the use of strong mobile reserves (tank armies and corps under the direction of the front commander), plus a significant number of anti-tank reserves (tank destroyer brigades, anti-tank rifle regiments and battalions).

Thus Miksche's vision of a defense in depth came to fruition: the Blitzkrieg was broken.

On the Western Front, the Allies would soon conduct attacks of their own and together with the Soviets turn the victor into the vanquished.

The American Experience of World War II

Of the 91 divisions the United States created during the war, only 16 were armored.⁹⁷ By 1943, armor divisions consisted of three armor, three infantry and three artillery battalions. This organization integrated armor and infantry units down to the battalion level. Infantry divisions had only one tank battalion. Unlike the Germans, Americans sought to penetrate enemy defenses with infantry, using tanks in an infantry support role.

"An armored division is of value in pursuit or exploitation. For plain and fancy slugging against an enemy who is unbroken or at least intact the tank battalion or group is adequate."⁹⁸

Therefore to achieve the fire-power necessary for a penetration, artillery became increasingly more important. In fact, operational research techniques (formerly used to determine efficiency of aerial bombardment and anti-submarine warfare) were applied to indirect fire, to achieve maximum target effect for ammunition expenditure.⁹⁹ So it was that the American solution for the assault became a fire-power oriented tactic.

FM 100-5, Field Service Regulations: Operations (1941), the US Army's doctrinal cornerstone, describes an "Attack of an Organized Position."¹⁰⁰ The manual contains many of the principles Bond and Crouch identified nearly twenty years before; however with the advent of the radio, integrating fire and maneuver would become dynamic.¹⁰¹

"528. The plan of attack consists of the *plan of maneuver* and *plan of fire*. The attack unit, artillery and supporting combat aviation commanders make detailed arrangements for coordinating the action of their units to carry out the common mission."¹⁰²

"553. Against a strong resistance and well-organized defense, the superior commander will prepare the assault of the hostile organized line of resistance by concentrating the firepower of all supporting weapons, including combat aviation, to neutralize the enemy and wear down his power of resistance before launching the assault. After the first on-rush, a series of local assaults delivered by units of varying strength on their own initiative continues the action. Each unit delivers its own assault at the earliest moment that promises success."¹⁰³

Summary of Historical Assault Doctrine

The following summary captures the salient principles described in FM 100-5 (1941), "Attack of an Organized Position" and incorporates considerations offered by other nations who shared the World War II experience:

1. The Objective: A "*physical objective*" (troops, terrain or lines of communication) the attainment of which "is the basis of his own and all subordinate plans. The objective should have the following characteristics:"¹⁰⁴

"a. Its capture must be possible within the time and space limits imposed by the assigned mission.

b. Its capture should assure the destruction of the enemy in his position, or the threat of its capture should compel the enemy to evacuate his position.

c. It should produce convergence of effort.

d. It must be easily identified.

e. Its capture should facilitate contemplated future operations."

2. Reconnaissance: A thorough reconnaissance is of primary importance...seek to locate the flanks of the hostile position. Reconnaissance is continual and must provide information of the objective area, routes of approach and obstacles. Determination of the weak points in the enemy dispositions is of vital importance.¹⁰⁵

3. Fire Support: Artillery conducts reconnaissance to determine location of observation posts, firing positions and routes of approach.¹⁰⁶ Preparation fires insure the continuity of the attack and is divided by phases:

a. Phase I - neutralize enemy artillery, destroy command and fire control, isolate the objective, destroys obstacles and assembled mechanized units.

b. Phase II - continue counter-battery fire and concentrate remaining artillery on the hostile areas of defense.

Artillery supports the maneuver commander's attack by providing successive fire concentrations throughout the depth of the hostile position.¹⁰⁷ During the attack, the supporting fires are concentrated against the fronts where the attacking echelon is making the greatest progress. When the attack echelon arrives close to the hostile position, the fire of all artillery...is concentrated on rearward defense areas.¹⁰⁸

4. Maneuver: When fire superiority is gained, the leading echelon closes to assaulting distance. Fire effect is increased by enfilade action. Flanking or oblique fire is especially effective...convergent fire forces the enemy to defend himself from several directions.¹⁰⁹ A force that successfully envelopes the enemy's flank may have to make a frontal attack to defeat a hostile reserve or may find a favorable opportunity to attack the hostile resistance in flank.¹¹⁰ When the supporting fires are lifted from the objective the assault unit overruns the hostile resistance in a single rush. Any delay in launching the assault after the fires are lifted allows the enemy to man his defenses.¹¹¹

After the assault of an organized position the attack often breaks up into a series of separate combats which are continued throughout the depth of the hostile position...The first task is to capture assigned objectives. Resistances are reduced by fire or outflanked.¹¹² Reserves are disposed behind points where the greatest progress is being made, to protect the flanks of the leading units and support them in the repulse of counterattacks.¹¹³ If the attack is unable to make further progress, the captured terrain is organized for defense and held until the attack can continue. Breakthroughs are exploited by armor units with the support of artillery and aviation, the gap is widened by attacking its flanks.¹¹⁴

*...hitting the enemy hard and fast, as the armor formations of World War II German and American armies found, minimized casualties, rather than the other way around.*¹¹⁵

LTC Douglas A. Macgregor

IV. The Assault: A Contemporary Experience

Combat Training Centers

The US Army's Combat Training Centers (CTCs) provide the force with the most realistic combat training short of war. Indeed, many returning Gulf War veterans attributed their success to the training they received at the CTCs.¹¹⁶ As laboratories, the CTCs provide valuable information concerning the state of unit proficiency and performance trends within the force. The Center for Army Lessons Learned (CALL) is chartered to observe designated aspects of "warfare," report their findings and explore solutions to discovered deficiencies.

One of the common problems experienced by battalion/task forces at the Combat Maneuver Training Center is the planning and execution of actions on the objective.¹¹⁷ Observer/Controllers (OCs) noted that frequently unit commanders and staffs fail to use reverse planning, from the objective to the line of departure. As a result, battalions are unprepared to mass combat power and conduct the final assault. Specifically, these tactical plans did not reflect "how to" mass at the critical point of penetration. More importantly, they did not address how to maintain momentum beyond the initial assault (i.e. use of reserves, follow and support forces etc.).¹¹⁸ While these observations may be training rather than doctrinal issues the OCs raise an important point in their concluding notes:

"Doctrine (71-1, 71-2) must be real and understood. It tells the "What." OPDs, CPXs and simulations must be used to gain proficiency in the "How." You can't do it right the first time on the ground at CMTC."¹¹⁹

These observations capture the heart of the "descriptive" versus "directive" doctrine debate. This debate reflects the differing views of GEN DePuy and LTG Cushman during the development of the 1976 edition of FM 100-5.¹²⁰ Where DePuy believed that the techniques essential in any tactical situation were "suppression, overwatch, the indirect approach, making contact with a small element and the rapid concentration of force against the enemy main body,"¹²¹ Cushman believed that there were "no rules" and that "tactics...meant teaching leaders how to think through tactical situations for themselves."¹²² Over time both general officers appear to have been right. Today, the army has a mixture of war fighting literature. *Doctrinal* manuals explain the principles behind the tactics, while *tactics, techniques and procedure* manuals offer "how to" information. Together, these manuals provide soldiers with both the art and science of warfighting.

Citing battalion operations as an example of this doctrinal compromise, FM 71-2, The Tank and Mechanized Infantry Battalion Task Force, lists four actions taken by commanders during offensive operations: find or create a weak point, suppress enemy fires, isolate the enemy and maneuver against weak points, and exploit success.¹²³ These points are clearly descendant from DePuy. However, Cushman's influence is also apparent. "Assaults and Actions On The Objective" describe the nature of the operation and the commander's considerations (art) in "thinking through the situation."¹²⁴ It is not until we examine FM 71-123 that the *tactics and techniques* (science) for the planning, preparation and execution of the assault are discussed in detail, including the integration of all combat functions throughout the process.¹²⁵ This is the "how" which the OCs have identified as lacking in unit CTC performance and which units should use in home station training.

From a different perspective, the CTCs also uncovered significant findings concerning the role of direct fire in offensive operations. The importance of fire power in the offense is unquestioned; a unit's direct fire effectiveness correlates to its ability to successfully execute doctrine. In this regard the National Training Center conducted a "direct fire" assessment.¹²⁶ The team focused their efforts on the direct fire of the tank, improved TOW vehicle and the Bradley fighting vehicle with a sample of 101 separate battles conducted by 16 task forces over 9 rotations. Their findings determined that on average the Opposing Forces (OPFOR) sustained 55% kills from modernized units and 52% kills from non modernized units. The data implies that more killing power does not necessarily translate into more enemy destruction. Also, engagement ranges for all systems was below 1100 meters, a statistic which suggests that units are stumbling into OPFOR defenses.

In its conclusions the team determined that "the most common direct fire related mission assigned by task force and company commander is overwatch."¹²⁷ However, the unit's inability to link overwatch missions to their reconnaissance capability wasted important direct fire assets. "If the scout platoons cannot pinpoint the location of the enemy defenses, the assignment of a base of fire may not be appropriate."¹²⁸ Therefore, similar to the CMTC findings, units appear to have difficulty achieving three of GEN DePuy's tactical essentials: suppression, overwatch and concentration of force against the enemy main body. While this research does not invalidate doctrine, it does reflect Clausewitz's contention that "war is simple, but it is the simple things which are hard." In "Desert Storm," units would experience a further degree of friction often lacking in CTC training - mortality.

Desert Storm

Clearly the defining event for US Army mechanized warfare was "Desert Storm." Faced with the task of extricating the Iraqi army from Kuwait, CENTCOM forces executed an attack which spellbound the world with speed, lethality and decisive victory. For those units that attacked across "the berm," it was the fruition of life-long study and training. For the authors of post Vietnam doctrine it was the first true test of Airland Battle in all its dimensions, save Nuclear, Biological and Chemical. However, success can also lead to false confidence. Fortunately the US Army has its share of healthy skeptics who recognize that there is always room for improvement. In the aftermath of the war, several studies assessed the effectiveness of virtually every aspect of the campaign.

The Fort Leavenworth Combined Arms Center archives holds a wealth of information entitled the "Gulf War Collection." The collection comprises after action reviews, analysis and oral histories. One portion, The Swain Papers, reveals three conclusions which are central to understanding the contemporary nature of actions on the objective:¹²⁹

- Air power massed in support of ground forces creates physical and psychological effects which can set the precondition for destruction of an army.
- Precise assessments of the effects of air, naval, and artillery bombardment are difficult.
- Targeting, collection and exploitation of intelligence in a timely manner is difficult to manage due to the quantity of intelligence data available.

The first comment validates World War II doctrine which recognized the importance of what is now "air interdiction."¹³⁰ The subsequent comments suggest that translating target effects into useful intelligence and distributing it in a timely manner to maneuver battalions remains a problem.¹³¹ This shortcoming impacts on the commander's ability to "see the battlefield," confirm his situational template and modify his plan accordingly.

A second study, "The Tait Papers" (formally known as the "Desert Storm After-Action Report Study Group") revealed other aspects of the war, both positive and negative which have implications for future combat.¹³²

"- When it became apparent that allied forces would have to breach a complex obstacle system to retake Kuwait, serious deficiencies in unit training were discovered."¹³³

This is an example of equipment fielding not keeping pace with doctrine. Several manuals, including FM 71-123, described how tanks equipped with mine-rollers and mine-plows were to conduct the assault breach, but until Desert Storm, the units simply did not have the equipment with which to train. COL Gregory Fontenot, former commander of 2nd Battalion, 34th Armor observed:

"Mine-plows and rollers now make the breach the responsibility of the tactical force. The current counter-obstacle equipment makes engineers superfluous because they do not bring anything special to the breach. The real issue is, 'How do you mark the breach for the follow on battalions?' This became the responsibility of the engineers."¹³⁴

In other areas the impact of technology on the modern battlefield helped commanders solve an historically difficult problem: how to mass on an enemy weakness.¹³⁵

"- Various Global positioning Systems (GPSs) used during the conflict eased the burden of navigation for commanders, enabling them to concentrate on maneuver and to mass combat power against the enemy."¹³⁶

In fact, navigation and accurate reporting in the often featureless desert relied heavily on GPS. When linked to laser range finders, the new technology allowed for increasingly accurate control of both direct and indirect fires. As an example, some units used GPS to establish Limits Of Advance and Restricted Fire Lines. This technique assisted in the prevention of fratricide, in a war where engagement ranges frequently exceeded the ability of visual identification of "friend or foe."¹³⁷ For actions on an objective spatially beyond a battalion commander's ability of observation, spot reports sent via FM radio were often the only available source of situational awareness. Accuracy was essential.¹³⁸

Perhaps more disturbing is a finding by the US Army Armor Center (USAARMC) conducted as part of their Desert Storm/Shield Lessons Learned update. One of their findings cuts right to the heart of the matter:

"Mech/Armor TM Commanders differed on tactical standards.

-[As an] Example all had different concepts of actions on the objective."¹³⁹

Although the Tait commission or the USAARMC failed to interview every battalion following Desert Storm, the observation remains significant because it parallels similar CTC conclusions. In fact, the NTC FORSCOM Leaders Training Program specifically prepared a training package to address this issue.¹⁴⁰ Entitled "Actions on the Objective," the document's purpose was "to provide a process to conduct a detailed assessment of how to incrementally reduce the objective by wargaming a specific course of action."¹⁴¹ Specifically, it was the NTC's attempt to address unit failure on the objective which they attributed to a lack of detailed planning and poor synchronization of combat multipliers.¹⁴²

The NTC training packet's bottom line is particularly revealing in that it may offer a new principle for the assault, its real strength lying in teaching commanders and staffs how to *think* about the operation. The assault's main points of instruction include:¹⁴³

1. Attack with a force ratio of 3:1 or greater. (mass)
2. Use combat multipliers to increase ratios and suppress the defender. (suppress)
3. Protect the force by taking away the defender's capability to return fire, see the battle, or execute indirect fires. (isolate)
4. Hit the defender simultaneously with as many systems as possible. (concentrate)
5. Force the enemy to fight a three dimensional battle. (exhaust)

The last point is of particular interest as it suggests a broader view of the assault, transcending Liddel Hart's two-dimensional metaphor of the "expanding torrent."

Both the Swain and Tait papers conclude that Desert Storm validated Airland battle doctrine, however, as the old expression suggests "the devil is in the details." Although the USAARMC study demonstrates that commanders viewed actions on the objective differently, the key to success appears to be found in the time afforded units to conduct rehearsals prior to initiating the offensive. Through breaching and assault drill rehearsals, units were able to overcome differences in doctrinal perspective, develop techniques appropriate to Southwest Asian conditions and establish the cohesive relationships they would require in combat.¹⁴⁴

These findings reveal that when commanders chose to deviate from doctrine, it was in a conscious effort to save lives. On the whole, units did not *violate* doctrine, rather they developed new techniques which allowed them to execute doctrine more efficiently. The use of Armored Combat Engineer vehicles protected by Bradleys to "reduce" enemy trench lines on the objective is an example of a technique consistent with doctrine.¹⁴⁵ Similarly, centrally controlling battalion recovery assets during the breach operations is "a technique" which enhanced company/team freedom of action, while facilitating the forward movement of follow on forces.¹⁴⁶ This was critical to ensuring operational *tempo*. The ability to view doctrine as a guide, yet discard it readily if found operationally counterproductive is in effect the "American way of war." Our contemporary experiences in training and war suggest that our doctrine is sound but that we must first understand it before we modify or discard it all together.

*Begin with observation, go on with experimentation, and, supported by both, discover law and reason.*¹⁴⁷

Leonardo da Vinci

V. Comparison and Conclusions.

Over the years military thinkers have attempted to capture the essence of battle, each in his own way, by colorful use of metaphor, rational analysis, experience and observation. Many of their ideas appear consistent, but manifest themselves in different ways on different battlefields. By analyzing the theoretical underpinnings of assault theory and then its application from World War I to the present, we find intrinsic threads of continuity. The following paragraphs represent a synthesis of ideas, each grouped under a corresponding "thread." This organization provides a means of comparing "discovered doctrine" to existing doctrine. From this comparison, we may draw conclusions concerning current doctrine's legitimacy, completeness and flexibility.

Threads of Continuity

Selection of the Objective.

Both Clausewitz and the NTC Observer/Controllers agree that the place to *begin* a study of actions on the objective is at the *end*. The final disposition or the end state will determine how the force should arrive. Incorporated in the commander's intent, the end state requires the unit, as Clausewitz advises, to arrive at the objective "as victor" (ergo destroyer of the enemy) and assume a posture which facilitates future operations. This posture indicates the "natural direction of the blow." However, the question remains, "How do we get there from here?" More to the point, "How do we accomplish the mission with maximum effect and a minimum expenditure of effort and resources - an economy of force?"

Economy of Force.

The answer to this question begins with the Tao and Sun Tzu's water metaphor. Our forces must take the path of least resistance, moving with speed where they are able and avoiding the unnecessary expenditure of resources where resistance is met. In practice, the Ch'i and Cheng (main and supporting efforts) alternate under the direction of the commander, who uses centralized control and decentralized execution. Momentum is ensured by following a line of operations that exploits weakness and avoids strength (surfaces and gaps). Speed of maneuver allows the attacker to retain freedom of action, dominating action in time and space. This paralyzes the enemy's ability to anticipate or respond, foiling his attempts to slow the attack, attrit the aggressor or counterattack.

Lines of Operations.

How did the commander come to select the line of operations? The first requisite knowledge is for the commander to understand capabilities and limitations, his own and the force he commands. He must then attempt to learn everything he can about the enemy through Intelligence Preparation of the Battlefield and reconnaissance. In particular, he undertakes to learn of the enemy's strengths and weaknesses, physically, morally and cybernetically. This knowledge allows him to "pit strength against weakness." Taking a frequently indirect approach, the commander will determine which pivots of maneuver will allow his force to maneuver with speed, achieving decisive results as it progresses toward its final objective. Often this is manifest by attacking from the flank and rear, while other forces (the minimum necessary) fix the defenders.

Relative Combat Power.

Of significance is the commander's plan to continually evaluate his losses against those of his enemy, gauged against the degree of success he has achieved in space and time. This relative evaluation of combat power is a key factor in determining when and where he should influence the battle. The tools at his disposal include the full range of combat multipliers, physical and cybernetic. The vehicle by which he gains this information includes reports from his subordinate commanders, his own observation and intelligence. Reconnaissance operations precede and occur continually throughout the fight. First they focus on the objective area, then move to the flank and beyond, in order to provide the commander with early warning and insight into his opponent's intentions.

Concentration.

In creating a penetration of the defensive position the attacker concentrates the maximum fire power effects at the point of attack: a known enemy area of weakness. The fire effects allow the assault force to approach the enemy until the supporting commanders must lift their own suppressive direct and indirect fires and shift them to other enemy locations. At the point of "break-in" the force resembles the nozzle of the "expanding torrent." Once the defensive position is penetrated the actions on the objective assume the character of simultaneous "smaller combats." Subunits continue to move along the "path of least resistance" reducing obstacles, bunkers and enemy fighting positions through fire and maneuver. They also attempt to expand the penetration by attacking laterally (*aufrollen*), never losing sight of their need for internal security.

Isolation.

To ensure the penetration's maximum effect, the commander ensures that the objective area is "prepared" and "isolated" from enemy observation and influence. Massed direct and indirect fires delivered by artillery, aviation, close air support and direct fire systems combined with electronic counter measures attrit and reduce the defender's ability to "resist" the assault. Isolation is achieved through the use of these same systems and the use of smoke. In particular the commander seeks to deny the defender the ability to reinforce weakened defensive positions, reposition forces or counterattack.

Exhaustion.

Here the commander seeks to cause the defender to fight a three dimensional battle; and, in another sense a fourth dimension: time. By achieving direct fire suppression of the defending force the attacker has fixed his opponent; denying action. Indirect fire further increases this effect in that the defender receives fire effects throughout the depth of the position. Counterbattery fires prevent the defender from responding in kind, even using assets which may be positioned outside the objective area. Electronic attack assets cripple the defender's command and control, defeating him cybernetically. Finally, army aviation and close air support prevent any opportunity for the defender to reposition behind covering and concealing terrain features. The cumulative effect of these systems, properly orchestrated to achieve the desired effect at the most opportune time, is one of exponential proportions. By rendering the defender impotent and attriting the full range of his combat systems, the attacker breaks the will of the enemy to sustain the fight.

Conclusions.

The previous pages attempted to synthesize assault doctrine from its ancient roots to the present. At face value it appears consistent with the armor and mechanized infantry doctrinal material in publication today. However there are several omissions which deserve attention.

1. Pivots of Maneuver. The concept, though conceived as an "operational" term perhaps more than a tactical one, has particular relevance in the assault. It links the idea of "surfaces and gaps" to the "center of gravity" (*schwerpunkt*). By maneuvering the main effort along a "path of least resistance" (directed to attack critical intermediate objectives) the attacking force achieves speed, security and shock effect: economy of force.

2. Relative Power. Combat power comparison is usually determined initially during the tactical decision making process. While that first analysis is important in determining where and how to concentrate friendly forces and fire power against enemy weakness, it falls short of providing the commander with the tools he needs to assess his effectiveness and his progress against the enemy's preservation and ability to continue to resist. Relative power is an important concept, in that it helps the commander identify the battle's culminating point and assists him in determining when and how to influence the battle.

3. Exhaustion. This last point is linked to the second. The more a commander is able to assess his combat function effects, the better he will manage the fight. Therefore, he must have a mechanism which allows him to judge the fight multi-dimensionally and cybernetically. The synthesis of combat function effect relative to the enemy will help the commander to more effectively exploit successful systems and eliminate ineffective ones.

US Army final assault doctrine is sound. We have synthesized the best elements of other armies' thinking and experience with our own to arrive at a well grounded, yet flexible approach to actions on the objective. As an institution perhaps our army's greatest attributes are pragmatism and healthy skepticism. These two qualities have allowed us to quickly grasp ideas which work and just as quickly discard the ones which do not. It is refreshing to read the many after action reviews and performance critiques following Desert Storm. Proud of their accomplishments, yet not content to rest on their laurels, soldiers recognized that there was room for improvement.

Can we improve our doctrine? The answer is yes, but it does not require a fundamental change. Rather we must begin to approach actions on the objective increasingly from a multi-dimensional perspective. New concepts like exhaustion are beginning to break our army's two and three dimensional mold. Increasingly, as the cybernetic domain and information warfare take on increasing importance in our tactical planning, we must understand and exploit these concepts to maximum effect. At the same time, we must never forget our predecessors' hard fought lessons. Actions on the objective means killing.

Common doctrine and process are important if we are to continue to retain our combat edge. For this reason we should take to heart the USAARMC's finding that "commanders had different concepts of actions on the objective." This observation demonstrates that, as successful as we were in Desert Storm, we could have been better. As doctrine evolves we must continue to document it, train it and internalize it. Only then will we be truly able to alert, upload, deploy and fight to win with unity of effort and economy of force.

*The Army must be able to resolve a battle quickly with rapid battlefield maneuver, simultaneous and synchronized attacks and application of overwhelming, disciplined combat power at the point of decision.*¹⁴⁸

Gen. J. H. Binford Peay III

VI. Implications for Future Doctrine and Training.

In his Military Review article entitled, "Building America's Power-Projection Army," GEN Peay stresses that, "Our power-projection army is guided by the view that land combat remains decisive in war and is the 'strategic core of joint warfighting.'"¹⁴⁹ Inherent in power-projection is the requirement to have a modern, effective and flexible doctrine which is inter-service compatible. As "downsizing" forces the army to consider how it may operate most effectively in the Joint arena, the necessity to have a doctrine which encompasses the best capabilities of each of the services is of extreme importance.

Throughout this monograph, the absolute necessity to achieve and maintain fire power superiority over a defending enemy resonates with unmistakable clarity. Every service has the capability to provide fire power effects to the army. Therefore, our doctrine must be truly joint. While some service futurists, like US. Air Force COL John A. Warden III, may suggest a service primacy in future combat, history demonstrates that "imbalance" leads to disaster. Research and development alchemy has yet to find the "silver bullet" and doubtlessly never will. Likewise, no service holds a premium for war winning capability. Is then *our* doctrine up to future war's challenges?

While the only true test is combat, the following aspects of assault doctrine may require attention if we are to insure its future effectiveness. They are presented in accordance with FM 71-2, The Tank and Mechanized Infantry Task Force.

Find and Create a Weak Point.

Effective reconnaissance is indispensable. LTC Myron J. Griswold, former commander of 3rd Battalion, 34th Armor observed:

The lack of success of US heavy brigade and battalion task force commanders in focusing combat power during offensive operations is traceable, in large measure, to the difficulty these leaders have in seeing throughout the depth of the battlefield. This difficulty manifests itself at the NTC, where most brigades and battalion task forces do not conduct effective reconnaissance.¹⁵⁰

Recalling that a key aspect of successful actions on the objective is to make the defender fight multi-dimensionally, our initial action therefore must be to "see" the enemy in depth.

Desert Storm provided a taste of the future through the use of J-STARS and satellite imagery. We must, however, develop the lines of communications and procedures now to ensure that our brigade and battalion commanders will have access to the information in the future. While detailed IPB typified SWA operations, our success was facilitated by the fact that the Iraqi army was generally unskilled in tactical deception. Future conflicts may include an enemy who on the opposite, constantly repositions or "fights dirty."

Suppress Enemy Fires.

In an era of Dual Purpose Improved Conventional Munitions, the Family of Scatterable Mines and laser guided munitions, artillery will continue to play a decisive role in actions on the objective. New technologies, however are significantly altering the way artillery fights. Dispersal and constant weapon system movement make suppression or neutralization all the more difficult. Nevertheless, the doctrinal necessity to silence enemy fires remains just as important to mission success as before. Digitization may solve some of these problems, however, we must ensure that future technologies remain complementary to the doctrinal requirements they are meant to solve.

Isolate the Enemy and Maneuver Against Weak Points.

As discussed, Global Positioning Systems greatly assisted our forces in desert navigation, but more importantly they gave commanders the ability to concentrate fire power at a chosen enemy weakness. Future technologies may further enhance or foil this capability, however the need to mass weapons effects at the desired place and time remain paramount to mission success. The concern of identifying enemy weaknesses, already discussed, is further complicated once the assault force "breaks-in" to the defensive position. Here the desire is to continue along the path of least resistance, following pivots of maneuver. The information exchange between assault forces and the commander will be essential for maintaining momentum and avoiding enemy strengths.

Exploit Success.

The exploitation of success is the product of the cybernetic domain. Current doctrine fails to adequately address the commander's responsibility to "know when he is winning." One of the few critical decisions an attacking commander should ever have to make is when and where to commit the reserve and when to stop the attack and consolidate gains. It is unlikely that future combat will alter this perspective. Here accurate and timely knowledge of his own force's strength vis a vis the enemy remains critical. While the projected "battalion and below command and control" (B2C2) system will assist commanders in this regard, it remains to be seen how intelligence products will interface and remain current throughout the battle; moreover, how will they reflect third and fourth dimensional aspects of the battle? Doctrine will continue to require commanders to "know their enemy." Digitization, it appears, will only confirm his knowledge.

Preparation and Training for Future War.

The experiences of Desert Storm combined with CTC observer/controller observations suggest that our doctrine is solid. Nevertheless, successful execution requires continual training. Currently, the Army's personnel rotation system virtually insures that not one battalion experiences more than one CTC rotation intact. By its second rotation, personnel turn over virtually ensures that continuity lies mostly in its unit designation. It is for this reason that the real value of the CTCs rests in its ability to train individuals. Only over time will the "common experience" translate to better unit performance.

As a result, doctrine remains the glue which binds unit proficiency; it is warfighting's common denominator. Training, therefore, must reflect doctrine along with its complementary techniques and procedures. That is why CTCs continually refer to doctrinal publications for validating their observations and suggestions for improvement. Future success in combat will naturally reflect the degree to which doctrine is internalized within the unit and between units. The implications for continued doctrinal "jointness" also suggest that, now more than ever, the Army must speak with one voice. We must agree on how we fight and insure that our doctrine is completely linked to the warfighting concepts of our sister services.

The "final assault" in many ways represents how we as an Army should continue to consider our warfighting mission. In reviewing this task, we have seen how the study of history plays an integral part of the doctrinal development process. It provides us with "threads of continuity" and principles which transcend time and technology. Therefore, the study of history remains an important activity in training future leaders. Professional

development classes, terrain walks and individual study must remain a corner stone of professional education and training.

Understanding doctrine is the first step toward successful execution. Therefore the challenge to future commanders is to develop in their subordinate leaders the cognitive skills necessary first to learn, then to apply doctrine with *sound judgment* and *creativity*.

Training to standard and honest After Action Reviews are essential to this process.

Doctrine provides soldiers with the foundation and the "common vocabulary."

Lastly, the "final assault" provides an insight as to how we might "not get it too wrong."¹⁵¹ Doctrine, wisely based upon thorough research and dispassionate analysis, yields the rational basis for "how we intend to conduct war."¹⁵² Our challenge is to ensure that the doctrine we embrace is correct, one which is appropriate for the challenges of future war. To this end we must remain skeptical of the tactics we employ. Is it out of tradition or because they are effective? This monograph reflects such an analysis, by addressing one aspect of our doctrine. Future war will likely include a "final assault." However only through a solid understanding of a well articulated doctrine, will our combat leaders find the needed flexibility to overcome the conditions of future battle.

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- ¹ Sun Tzu, The Art of War, Trans. Samuel B. Griffith, (New York: Oxford University Press, 1971), p. 85.
 - ² FM 100-5, Field Service Regulations: Operations, (Washington, DC: US Government Printing Office, May 22, 1944), p. 32 and 109.
 - ³ FM 100-5, Operations, (Washington, DC: US Government Printing Office, 1993), p. 7-5.
 - ⁴ This is the author's observation over a period of years serving as a doctrine writer for Training and Doctrine Command (TRADOC), as a "lead writer" at the Combat Maneuver Training Center (CMTC) and as an armor battalion operations officer (S-3) in Germany.
 - ⁵ Myron J. Griswold, "Focusing Combat Power: Seeing is Winning," Military Review, July 1994. p. 70.
 - ⁶ Michael E. Howard, "Military Science in an Age of Peace," Lecture delivered at Chesney Gold Medal Lecture, 3 October 1973, School of Advanced Military Studies Reprint, Command and General Staff College, Fort Leavenworth, KS.
 - ⁷ Carl von Clausewitz, Principles of War, Roots of Strategy, Book 2, (Harrisburg, PA: Stackpole Books, 1987), p. 318.
 - ⁸ Sun Tzu, The Art of War. p. 78.
 - ⁹ Carl von Clausewitz, On War, Trans. Michael Howard and P. Paret, (Princeton, NJ: Princeton University Press, 1984), p. 526.
 - ¹⁰ Sun Tzu, p. 77-78.
 - ¹¹ Clausewitz, On War. p. 526.
 - ¹² Sun Tzu, p. 79-80.
- "12. Consequently, the art of using troops is this: When ten to the enemy's one, surround him.
13. When five times his strength, attack him;
 14. If double his strength, divide him.
 15. If equally matched you may engage him.
 16. If weaker numerically, be capable of withdrawing;
 17. And if in all respects unequal, be capable of eluding him, for a small force is but booty for one more powerful."

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¹³ Ibid., p. 63.

"3. The first of these factors is moral influence; the second, weather; the third, terrain; the fourth, command; and the fifth, doctrine."

¹⁴ John K. Fairbank and E. Reischauer, China: Tradition and Transformation, (Boston: Houghton Mifflin Company, 1978), p. 46-47 and 49.

"*Taoism*. Next to Confucianism, the most important stream in Chinese thought is Taoism (pronounced *dowism*). It was in large part a philosophy of retreat and withdrawal on the part of thinkers who were appalled by perpetual warfare, instability, and death and so turned away from the struggle for power, status, and wealth. In the face of infinite time and space, they accepted the unimportance of individuality except as human beings are individual manifestations of vast cosmic forces. This philosophy constituted a protest of common men against the growing despotism of rulers. It also expressed the rebellion of the very uncommon man of intellect or sensitivity against the growing rigidity of the moralists, who were following in the footsteps of Confucius. Where both the moralists and the rulers sought to bring men into conformity with social patterns, The Taoists stoutly championed the independence of each individual, whose only concern, they maintained, should be to fit into the great pattern of nature. This was the *Tao*, literally the "Road" or "Way," a term used by Confucius to describe the social system he advocated but given a metaphysical interpretation in Taoism...

Taoism, in fact, has served as an admirable balance to the dominant concepts of Chinese culture. The centralization of power placed sharp limits on human freedom; Confucian morality and insistence on social conformity were even more restrictive. But in Taoism the individual could achieve self-expression; his intellect was free to wander at will. Since neither Confucianism nor Taoism were jealously exclusive religions in the Western sense, the individual and even the whole of society could be Confucian and Taoist at the same time, achieving perhaps a healthier psychological balance on these two bases than could have been achieved on only one. The man in power was usually a Confucian positivist, seeking to save society. The same man out of power became a Taoists quietist, intent on blending with nature around him. The active bureaucrat of the morning became the dreamy poet or nature lover of the evening. This balanced dualism in philosophy and in personality has persisted until the modern day."

Compare: Basic Writings of Mo Tzu, Hsun Tzu, and Han Fei Tzu, Trans. Burton Watson, (New York: Columbia University Press, 1967), p. 4-5 and 9-10.

"All Chinese philosophical systems are concerned to some extent with questions of political science, but none so exclusively as Legalism. All extant writings of the Legalist school deal with a single problem: how to preserve and strengthen the state. Like Machiavelli's famous treatise, to which it has often been compared, Han Fei Tzu's work is a handbook for the prince, with a few chapters thoughtfully added for the guidance of his ministers.... The Confucians and Mo-ists consistently described the ideal ruler in moral and religious terms: father and mother of the people, the man of perfect virtue, the Son of Heaven. Legalism, because it rejected all appeals to religion and morality, had to find some other set of terms in which to describe and glorify the ruler. Taoism, which likewise rejected the concepts of conventional religion and morality,

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provided such a set. The language used by Taoism to describe the Taoist sage was therefore taken over by the Legalists and employed to describe the omnipotent ruler of the ideal Legalistic state.

The Taoist sage has absolute understanding; the Legalist ruler wields absolute power. In the quality of absoluteness, they are alike. The Taoist sage rises above all conventional distinctions of right and wrong, good and evil; so does the Legalistic ruler, for he is a law unto himself. The Taoist sage adopts a course of quietude and deliberately refrains from forced or unnatural activity. The Legalist ruler, head of a vast bureaucracy, does the same, issuing orders, quietly judging the efficiency of his ministers, but refraining from any personal intervention in the actual affairs of administration; he sets up machinery of government and then allows it to run by itself. The Taoist sage withdraws from the world to a mysterious and transcendental realm. The Legalist ruler likewise withdraws, deliberately shunning contacts with his subordinates that might breed familiarity, dwelling deep within his palace, concealing his true motives and desires, and surrounding himself with an aura of mystery and inscrutability."

¹⁵ Sun Tzu, p. 89.

"*Chang Yu*: The nature of water is that it avoids heights and hastens to the lowlands. When a dam is broken, the water cascades with irresistible force. Now the shape of an army resembles water. Take advantage of the enemy's unpreparedness; attack him when he does no expect it; avoid his strength and strike his emptiness, and like water, none can oppose you."

Compare: WM. Theodore de Bary and Wing-Tsist Chan, Sources of Chinese Tradition, (New York: Columbia University Press, 1960), p. 61.

"Lao Tzu (or Tao-te Ching)

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Of all things yielding and weak in the world,
None is more so than water.
But for attacking what is unyielding and strong,
Nothing is superior to it.
Nothing can take its place.

That the weak overcomes the strong,
And the yielding overcomes the unyielding,
Everyone knows this,
But no one can translate this into action.

Therefore the sage says:
"He who takes the dirt of the country,
Is the lord of the state.
He who bears the calamities of the country,
Is the king of the world."
Truth sounds paradoxical!"

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¹⁶ B. H. Liddel Hart, "Strategy," *Encyclopedia Britannica*, 14th ed. Vol 21 (1929), p. 452-59. Combat Studies Institute Reprint, (Fort Leavenworth, KS: US Army Command and General Staff College, 1993), p. 18-20.

¹⁷ William S. Lind, Maneuver Warfare Handbook, (Boulder, CO: Westview Press, 1985), p. 73-80.

Compare:

B. H. Liddell Hart, A Science of Infantry Tactics Simplified, (London: William Clowes and Sons, Ltd., 1926), p. 49-50:

The Expanding Torrent Method of Attack

We must employ a scientific system of attack which will reconcile and combine *surprise by speed with security*.

The breach must be widened in proportion as the penetration is depended, by automatically progressive steps beginning with the platoon and working up to the brigade.

The broad principles of such a system I have endeavored to deduce by examining and analyzing Nature's method of attack.

If we watch a torrent bearing down on each successive bank or earthen dam in its path, we see that it first beats against the obstacle feeling and testing it at all points.

Eventually it finds a small crack at some point. Through this crack pour the first dribblets of water and rush straight on.

The pent-up water on each side is drawn towards the breach, wearing away the earth on each side and so widening the gap.

Simultaneously the water behind pours straight through the breach, between the side eddies which are wearing away the flanks.

Directly it has passed through, it expands to widen once more the onrush of the torrent. Thus as the water pours through in ever-increasing volume the onrush of the torrent swells to its original proportions, leaving in turn each crumbling obstacle behind it.

Thus Nature's forces carry out the ideal attack, automatically maintaining the speed, the breadth, and continuity of the attack. Moreover, the torrent achieves *surprise* and hence *economy of force* by progressively exploiting the weak spots of the defense.

¹⁸ FM 100-5, 1993. p. 7-13.

¹⁹ Clausewitz, p. 526.

²⁰ Clausewitz, p. 524.

²¹ Ibid., p. 525.

²² Ibid., p. 528.

²³ Ibid., p. 546

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²⁴ Ibid., p. 546.

²⁵ Ibid., p. 546,7.

²⁶ Ibid., p. 547.

²⁷ Sun Tzu, p. 85.

"Anciently the skillful warriors first made themselves invincible and awaited the enemy's moment of vulnerability."

²⁸ Ibid., p. 85.

"Thus they are capable of protecting themselves and of gaining a complete victory."

²⁹ Clausewitz, p. 357.

³⁰ Antoine Henri Jomini A. Summary of The Art of War, Roots of Strategy, (Harrisburg, PA: Stackpole Books, 1987), p. 497.

³¹ J.F.C. Fuller, The Foundations of the Science of War, (London: Hutchinson & CO, Ltd., 1926), p. 298

³² Ibid., p. 299.

³³ Clausewitz, p. 358.

³⁴ Clausewitz, p. 357.

³⁵ Ibid., p. 357-8.

³⁶ FM 100-5, 1993. p. 9-0.

³⁷ Dr. James J. Schneider is Professor of Military Theory at the School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, Kansas.

³⁸ James J. Schnieder, The Theory of Operational Art, (Fort Leavenworth, KS: US Army Command and General Staff College, 1988), p. 33.

³⁹ Fuller, p. 299.

⁴⁰ Schneider, p. 37. "A pivot of maneuver is a decisive point the seizure of which will maintain the momentum and so sustain the initiative of an attack. The retention of a pivot of maneuver in defense will exhaust the momentum of an attack and perhaps wrest the initiative."

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⁴¹ Ibid., p. 38.

⁴² Ibid., p. 38.

⁴³ Ibid., p. 39.

⁴⁴ Clausewitz, p. 383 and 490.

⁴⁵ Fuller, p. 156.

⁴⁶ Ibid., p. 286.

⁴⁷ Schneider, p. 7.

⁴⁸ S. L. A. Marshall, Men Against Fire: The Problem of Battle Command in Future War, (Gloucester, Mass: Peter Smith, 1978), p. 158-161.

⁴⁹ The theory of the "empty battlefield" refers to a battlefield characterized by dispersed or "invisible" troops in order to survive the ravages of increased weapon system range, rate of fire and lethality. The isolation experienced by soldiers in early "modern war" severely impacted upon unit cohesion; hence, combat effectiveness. Paradoxically, despite increased battlefield lethality, casualty rates declined as dispersed units became less likely to endure sustained losses.

⁵⁰ Ibid., p. 91.

⁵¹ Ibid., p. 164-5.

⁵² Schneider, figure 2. Destruction, Disorganization, Disintegration

⁵³ Patrick O'Sullivan, Terrain and Tactics, (New York: Greenwood Press, 1991), p. 118.

⁵⁴ FM 101-5-1, Operational Terms and Symbols, Initial Draft, (Washington, DC: US Government Printing Office, January 1994), p. 1-17.

⁵⁵ FM 100-5, 1993, p. 7-13.

⁵⁶ Ibid., p. 7-1.

Ten Aspects of the Assault

1. Successful and continuous **reconnaissance** is vital for success.
2. **Maneuver** to avoid enemy fires and obstacles.

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3. **Suppress enemy fires.**
4. **Maintain security.**
5. **Retain command and control and organization.**
6. **Isolate the enemy force.**
7. **Retain agility to shift the main effort as conditions unfold.**
8. **Mass superior combat power at the key time and place.**
9. **Speed reduces casualties and maintains a tempo the enemy cannot handle.**
10. **Exploit success by pressing the attack or passing other forces forward**

⁵⁷ Ibid., p. 8-4 and 8-5.

⁵⁸ Infantry in Battle, (Washington DC: The Infantry Journal Incorporated, 1939), p. 323.

⁵⁹ Bloch, Jean de. The Future of War In Its Technical Economical and Political Relations, trans. R. C. Long, (Boston: The World Peace Foundation, 1914), p. 7 and 24 Reprint in US Army Command and General Staff College. A699 The Evolution of Military Thought/Book of Readings, (Fort Leavenworth: USACGSC, Nov. 1991)

The four revolutionary changes in firearms include: increased volume of fire, greater range, increased precision and the effects of smokeless powder on the battlefield.

⁶⁰ Major de Pardieu, A Critical Study of German Tactics and of The New German Regulations, Trans. CPT Charles F. Martin. (Fort Leavenworth, Kansas: United States Cavalry Association, 1912).

⁶¹ Ibid., p. 102.

⁶² Bernard and Fawn M. Brodie, From Crossbow to H-Bomb: The Evolution of the Weapons and Tactics of Warfare, (Bloomington: Indiana University Press, 1973), p. 190.

⁶³ de Pardieu, p. 102-103.

⁶⁴ Ibid., p. 102-103.

⁶⁵ Leslie Vickers, Training for the Trenches: A Practical Handbook, (New York: George H. Doran Company, 1917), p. 104.

⁶⁶ Ibid., p. 105.

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⁶⁷ Andre Laffargue, The Attack in Trench Warfare: Impressions and Reflections of a Company Commander, Ed. G. A. Lynch, (Washington: The United States infantry Association, 1916), p. 7.

⁶⁸ Donald M. McRae, Offensive Fighting, (Philadelphia: J. B. Lippencott Company, 1918), p. 159.

⁶⁹ Laffargue, p. 15-16.

⁷⁰ McRae, p. 161.

⁷¹ Laffargue, p. 40,

"Thus the first line has made its effort; in the centers of resistance, it has scarcely gotten a good hold on the exterior borders; in the intervals, on the contrary, it has expanded widely like a wave which has broken through a dike at one point. But us has been stopped, out of breath, in front of the second line of defense, whose resistance is organizing, or it has been nailed to its place by flanking fire from still unconquered centers of resistance; it is composed from now on of weak groups of real fighters, just strong enough to mark out here and there the limits of the conquered ground, and of a multitude of isolated individuals and entire units which are scattered over the whole zone of attack."

⁷² Vickers, p. 109.

⁷³ McRae, p. 163.

⁷⁴ Ibid., p. 130.

⁷⁵ Infantry in Battle, p. 307. "The attack by infiltration, or soft-spot tactics, endeavors to push rapidly through the weak parts of the enemy position, avoiding or temporarily masking strong parts. The small groups that filter through unite beyond the resistance. The strong points are then gradually reduced by actions from the front, flank and rear."

Compare: Bruce I. Gadmundsson, "Attack or Assault," Marine Corps Gazette, February 1991, p. 38-39. See "stormtroop" or "infiltration" tactics.

⁷⁶ Basil H. Liddel Hart, A Science of Infantry Tactics Simplified, (London: William Clowes and Sons, Ltd., 1926), p. v-vii. Note Forward by Gen. Sir Ivor Maxse.

⁷⁷ Ibid., p. xiv, xv.

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⁷⁸ Ibid., p. 12. From an analysis of individual combat, Hart deduces governing principles for application to battle. They include:

Economy of Force:

- A. Security** - Obtained through disposition or formation of security:
 - 1. Dispersion
 - 2. Information
 - (a) Gained in battle
 - (b) Through observation
 - (c) Through probing
 - 3. Cooperation - [vertically and horizontally]

- B. Surprise** - Obtained in time, space or force by means of *Decisive Maneuver*
 - 1. Concentration
 - 2. Concealment
 - 3. Speed
 - (a) movement
 - (1) forward, momentum
 - (2) lateral
 - (3) flexibility
 - (b) mind
 - (1) training
 - (2) natural ability
 - (3) promptness of information

- C. Mobility** - the tactical link between security and surprise; Economy of Force
 - 1. Direction - given by the commander
 - 2. Speed
 - 3. Cooperation

⁷⁹ Ibid., p. 10, 11. "The Man Fighting In The Dark"

I.--In the first place he must seek the enemy. Therefore the man stretches out one arm to grope for his enemy, keeping it supple and ready to guard himself from surprise (protective formation and reconnaissance).

II.--When his outstretched arm touches his enemy, he would rapidly feel his way to a highly vulnerable spot, such as the latter's throat (reconnaissance by fighting, or probing).

III.--The man will then seize his adversary firmly by the throat, holding him at arms length so that the latter can neither strike back effectively, nor wiggle away to avoid or parry the decisive blow (fixing).

IV.--Then while his enemy can recover the man instantly follows up advantage by taking steps to render him finally powerless (final exploitation of success).

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To follow this sequence of action is the only sure path to victory. The act of fixing can only be neglected, if the enemy commits some mistake of supineness or the neglect of his own security by which he fixes himself without our intervention and so exposes himself to an immediate knock-out blow.

⁸⁰ P.S. Bond and E.H. Crouch, Tactics: The Practical Art of Leading Troops in War, (New York: The American Army and Navy Journal, Inc., 1922), p. 53-54.

⁸¹ Ibid., p. 51-80. Bond and Crouch list fourteen "General Problems of the Attack." Concerning the assault, the following excerpts summarize their major points:

1. Intelligence - (p. 67) Information during the progress of an attack is even more necessary than in preparation therefor. Subordinate commanders must keep their immediate superiors constantly advised of the situation of their units. Often the superior can obtain this vitally necessary information in no other way.

2. Plans and orders - (p. 57) Plans for military operations should be of the simplest nature. Simplicity is the keynote of sane tactical procedure. Only the simplest plans can be successfully carried out in the confusion incident to combat-complicated measures invite disaster.

Plans and order must be clean cut and definite...[and] should provide a clear and definite mission for every fraction of the command.

3. Concentration of force - (p. 57-58) Decisive results are achieved only by the offensive, and a successful offensive implies a concentration of superior force at the point of attack, whatever may be the situation at other localities.

The principle of concentration of force is applicable to units of any size. The platoon overcomes a hostile resistance by intelligently maneuvering its two section and bringing their combined fire to bear. Concentration of force is the aim of all tactics, on both a small and large scale.

The mere assembly of masses of troops and supplies in one locality does not alone constitute a concentration of force. The force must be intelligently applied, and certain common mistakes avoided.

4. Movement of troops and supplies - (p. 58) As the capacity of routes of transportation is frequently inadequate for large concentrations, carefully prepared schedules of movement are necessary, in order to utilize existing routes to the best possible advantage.

5. Surprise - (p. 60) The element of surprise is usually essential to the success of an attack. Surprise is achieved by secrecy in preparation and vigor and rapidity in execution. The enemy must be prevented from gaining knowledge of concentration.

6. Deployment - (p. 61) *Security*, Each column must reconnoiter and cover its own front and flanks in the usual manner (except when moving up to an established front, and maintain contact with adjacent columns. On approaching the deploying position this should be thoroughly reconnoitered before committing the troops to a deployment.

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7. Fire and movement in battle - (p. 65-66) ...combat consists essentially in the advance of the attacker's infantry against that of the defender. The defender will oppose this movement by fire. Accordingly in order to advance, the attacker must beat down the fire of the defense by a superior fire in which all available fire weapons take part. The attack then, has two elements, *fire and movement*. The intelligent combination of these two elements of battle, is the aim of all training.

Fire superiority. Without superior fire a continued advance is impossible. The attacker therefore establishes fire superiority, and under its protection advances to a position from which still more effective fire is possible—that is, closer to the defense, and on its flanks when possible.

The elements of fire superiority are volume, accuracy and proper distribution,... The attacker must also evade the effects of the hostile fire by employing suitable attack formation, and utilizing such cover as is available. The attacker cannot advance without fire superiority, and should never fail to advance when he has it. Fire superiority having once been established, must be maintained.

Advance by rushes. Infiltration. The advance is accordingly usually made by alternate rushes of portions of the line, varying in size from one or two individuals here and there to a platoon, the stationary portions of the line meantime continuing to fire with increased intensity.

Where rushes of large fractions are impossible the line may advance by individuals or small groups running or crawling forward under such cover as can be found. This process is known as "infiltration." The more effective the fire of the defense, the smaller must be the size of the fractions executing the forward movement.

Accompanying weapons of the infantry. In addition to the weapons carried by its own members the infantry rifle platoon in combat enjoys the close support of machine guns, light mortars and one-pounder (or 37 mm.) cannon, and 3-inch (or 75 mm.) guns detached from the artillery to accompany the infantry in battle.

The principle functions of these weapons is to knock out hostile machine guns which may have escaped the fire of the artillery, and are too well protected to be disposed of by the fire of rifles and automatic rifles. They are also employed to reach hostile troops in sheltered positions, and machine guns are especially valuable in covering the flanks and repelling counter attack.

8. Coordination, control and direction - (p. 68) In the fight in open warfare...the action soon breaks up into a number of little combats by the fire units. Some of these will advance more rapidly than others and continuity of the front may be lost. If the disorganization becomes great, a halt is made on a designated objective, and the front is reconstituted.

The extent to which objectives should be prescribed accordingly depends on the conditions, especially the fighting power of the defender. Objectives should be prescribed to the extent necessary to control and coordinate the attack and afford reasonable insurance against disaster. They should never be allowed to limit a success which might otherwise be achieved.

9. Continuity of the attack - (p. 70-73) It will seldom be wise to reinforce units which have been held up. The enemy should be attacked where he is giving way and not where he is holding. The higher commander should be prompt to exploit the successes of his units that have effected such penetration, by use of their reserves. The intermediate resistances are then broken down by attacks against their flanks and rear. A position which has strongly resisted a frontal attack will

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often crumble under a combined attack in front and flank. Thus exploitation proceeds by widening and deepening the penetrations.

If the attacking unit which has made a penetration acts promptly and is adequately reinforced, it will be able to widen the breach, break down the adjacent resistance, and enable its neighbors on the flank to advance to its support. Therein lies the essence of victory.

All gains must be tenaciously held. If unable to advance a unit must at least not retreat. The commander-in-chief should be able to rely upon his infantry to hold every inch of ground.

Supports and reserves have an important bearing on nearly every problem that confronts the commander.

The functions of supports are:

1. To replace losses and fill gaps in the firing line.
2. To envelop resistances.
3. To guard the flanks and oppose counter attack.
4. To relieve exhausted units and carry on the attack.
5. To assist in the organization of captured terrain.

Reserves are employed in a similar manner but on a larger scale. They relieve front line units in their entirety when the latter are exhausted, and are employed for exploitation and pursuit. The reserves of small units are known as local, those of larger units as general reserves.

Maintenance of Man Power. At some time a critical instant is reached when the division is said to be exhausted. The men may be physically worn out, their morale may be low, and the division may have suffered heavy casualties. Its fighting efficiency is so lowered that it can no longer be advantageously employed in the front line. Unless it is relieved the division will soon reach the "breaking point" - it will fail in an attack, or its morale will be so injured that an unduly long time will be required to rebuild and restore it.

10. The assault - (p. 73) When practicable the assault of one unit should be covered by the fire of another up to the last moment.

The confusion resulting from the assault offers a favorable opportunity for counterattack by any formed troops of the enemy. Other units should be placed promptly in positions to protect the assaulting troops from such attacks. A few men of the unit itself, including, if possible, some automatic riflemen, are also pushed to the front to guard the unit during reorganization. To guard against counter attack and hold ground won is the first duty of the assault force.

11. Exploitation. Pursuit - (p. 74) When the defender has been driven from a strongly organized position into the unorganized terrain in rear, the best opportunity to inflict damage upon him is afforded. This demands on the part of the attacker, prompt continuation of the advance before the defender can reorganize for further resistance, or in case the defender decides to withdraw, a prompt pursuit before he can reassemble his scattered forces and organize rear guards to cover his retreat. Prompt and vigorous action at this critical time will usually result in heavy damage to the defender with small losses to the attack.

Troops which have been engaged in a protracted attack are in no condition to pursue.

12. Security - (p. 74) A commander may be excused for being defeated, but never for being surprised.

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Combat reconnaissance to the front and flanks is continuous by all units. For smaller units this involves constant observation by the leader in person, by scouts and men on the flanks of the line. For larger units it involves the use of combat patrols to give warning, or detachments to offer resistance, according to the size of the unit and the extent of exposure.

13. Reinforcement and supply - (p. 78) Supplies of all kinds are rapidly consumed in combat. The most important supplies, in order of their importance are ammunition, water and food.

14. Evacuation of wounded and prisoners - (p. 80, 84) The evacuation of the wounded is an important element of morale and discipline. In addition to the fact that the wounded are entitled to and should receive prompt attention, their presence with a command has a bad moral effect, especially if there is any suggestion that they are being neglected.

Prisoners are turned over by each unit to the net superior headquarters. They are sent to the rear under small guards, slightly wounded men being used when practicable.

⁸² FM 71-1. Tank and Mechanized Infantry Company Team, (Washington: US Government Printing Office, 22 November 1988), p. 3-42.

⁸³ F. O. Miksche, Attack: A Study of Blitzkrieg Tactics, (New York: Random House, 1942), p. 10.

⁸⁴ Ibid., p. 14.

⁸⁵ Ibid., p. 39.

⁸⁶ Ibid., p. 41. "A *Schwerpunkt* implies a strictly local superiority methodically organized during the entire battle. The movement of a *Schwerpunkt* is a continual seeking for the weakest points of resistance, in order to attack them with local superiority. It is a constant swaying back and forth to maintain initiative, superiority, and surprise even in the smallest details of the fight."

Compare: William S. Lind, Maneuver Warfare Handbook, p. 17-18. "Schwerpunkt...is sometimes translated as "point of main effort," but such a translation is dangerous. it is not a point on a map. it is where the commander believes he can achieve a decision, and translates into a unit, as in "Schwerpunkt is 2nd battalion."

When a unit is designated the focus of effort, all other units work to support it. It gets the artillery, air and so on. The reserve is positioned to be able to exploit its success. its neighbors each ask themselves, "What can I do to support the Schwerpunkt?"...

Schwerpunkt is not just the main attack (though the main attack is often at the Schwerpunkt). It is a conceptual focus, not just a physical one. All commanders refer to the Schwerpunkt, along with their superior's intent and the mission, in making their own decisions. Each makes sure his actions support the Schwerpunkt...

The Schwerpunkt can also be understood as the harmonizing element or medium through which the contracts of the intent and the mission are realized. It pulls together the effort of all subordinates and guides them toward the goal, toward the result their commanders want."

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Compare: James J. Schneider and L. Izzo, "Clausewitz's Elusive Center of Gravity," Parameters, p. 46-57. "The concept of the center of gravity (the German term is *schwerpunkt*) forms a principle building block in Clausewitz's edifice *On War*... This rather obvious sequence leads us to an analogy that will illustrate it more clearly-that is, the nature and effect of the center of gravity.

A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for the a blow; furthermore, the heaviest blow is that struck by the center of gravity. The same holds true in war. The fighting forces of each belligerent-whether a single state or an alliance of states-have a certain unity and therefore some cohesion. Where there is cohesion, the analogy of the center of gravity can be applied. Thus these forces will possess certain centers of gravity, which by their movement and direction, govern the rest; and those centers of gravity will be found wherever the forces are most concentrated (Clausewitz, On War, p. 485-86.)...

"Down through the years the Germans adopted the concept of the center of gravity (*schwerpunkt*) as a useful operational design tool because of its close association with the principle of concentration of mass or force. In the German language, "concentration of mass" is translated as *schwerpunktbildung*. As the Germans began to articulate their blitzkrieg doctrine, the term became particularly relevant. The success of the blitzkrieg depended largely upon the rapid shifting and deployment of concentrations of armored forces. These armored forces, thus concentrated, constituted in the German view the *schwerpunkt* or center of gravity of the operation. In efforts to explain the nature of blitzkrieg theory, Western analysts during World War II began to confuse *schwerpunkt* with another key element of operational design-the *decisive point*."

Aufrollen: "The *Aufrollen* which alternates with the movement of the *Schwerpunkt* is the immediate and methodical exploiting of each local success by side thrusts. The *Aufrollen* thus protects the flanks of the advancing units.

⁸⁷ Ibid., p. 43. Also see Lind, Maneuver Warfare Handbook, p. 74.

⁸⁸ Shelford Bidwell and D. Graham, Fire-Power: British Army Weapons and Theories of War 1904-1945, (London: George Allen & Unwin, 1982), p. 235.

"When on the move the [Panzer] division was preceded by the reconnaissance unit, with the main body following in a regular, almost parade ground formation. The tanks led, moving in several ranks with some artillery, 88mm and 150mm sturmgeschutz close behind. The rest of the artillery followed in column on the left and right flanks, the whole forming a square inside which traveled the motor infantry, many of their vehicles towing more anti-tank guns. (The establishment was fifty 50mm PAK, but many of the obsolescent lighter guns were retained.) Headquarters and 1st line supply vehicles were in the rear, but all commanders rode in front. When the enemy position was located it was closely reconnoitered by the battle group or the divisional commander and the defending anti-tank guns located. This was done methodically and the preparation of the attack might take three hours. In the first phase the anti-tank guns would be silenced by field artillery fire, the shell-firing 75mm of the Mark IV tanks, and often by long range fire of the 88mm and the 50mm guns as well. When the enemy fire from the 25 pounders, fully

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visible in their direct fire positions, had slackened sufficiently, the tanks and the motor infantry in their vehicles charged, some tanks going straight through the gun line, while others helped the infantry mop up. The tanks then rallied to the rear to refuel and rearm, the infantry put the captured locality in a state of defense and the anti-tank guns came up to join them.

If a strong force of British tanks was encountered the battle group sometimes adopted the ruse of ordering the infantry and anti-tank artillery to form a defensive line, and when this was ready to draw the British tanks on to it by a feigned withdrawal; the panzers slipping between the gun intervals to take up positions among the infantry ready to counter-attack once the British had as usual, fallen victim to anti-tank fire."

⁸⁹ Ibid., p. 109-112.

⁹⁰ Miksche, p. 195.

⁹¹ Ibid., p. 203-226. Miksche devotes an entire chapter of Attack to the concept of "Islands of Resistance." This is a very important document in that it appears to closely resemble the nature and technique of what would become Soviet defensive doctrine.

⁹² Ibid., p. 195-6.

⁹³ Ibid., p. 197.

⁹⁴ Ibid., p. 198-9 and 227. "The system of defense advocated as an answer to the Blitz attack consists of two main parts: a web of defense in which the attacker will be netted and delayed, and a large-scale counter-attack or counter-blitz that will defeat the enemy rather than merely repel him."

⁹⁵ "Collection of Materials for the Study of War Experience: The Battle of Kursk," No. 11, The Journal of Slavonic Military Studies, Vol. 6, No. 3, September, 1993, p. 450.

⁹⁶ Ibid., p. 474.

⁹⁷ Hew Strachan, European Armies and the Conduct of War, (London: George Allen & Unwin, 1983), p. 185.

⁹⁸ Ibid., p. 185. Quotation from General McNair, commander of US Army Ground Forces.

⁹⁹ Bidwell, p. 289. "Using as a definition of intensity the parameter shells delivered per area per unit time connected with the rate of casualties of attackers and attacked, the somewhat obvious conclusions were reached concerning the weight of bombardment to an upper limit of usefulness; namely, the superior merits of a dense pattern of small shells to a fewer heavy shells or bombs, the brief duration of the stunning or 'neutralizing effect,' and that short bursts of intense fire were sometimes more effective than a prolonged bombardment. None of this was news to the men who had been learning empirically for the previous two years. Nor was it an original thought that in the 'dog-fighting' inside the objective, enemy resistance could often be cleared up more

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expeditiously and economically by deft infantry action than by calling down a huge concentration. To be sure, but soldiers learn quickly, and the lesson most deeply ingrained in veterans is caution."

¹⁰⁰ FM 100-5, Field Service Regulations: Operations, (Washington: Us Government Printing Office, 1941), p. 116-130.

¹⁰¹ Strachan, p. 185-6. "The lubricant of all these independent but interdependent arms was the radio...They became agents of tactical flexibility. They conquered time. An infantry platoon could call up artillery or aerial support: a tank commander could talk directly to the pilot overhead...But the radio was also essential: it enabled rapid concentration against weakness and thus ensured that the momentum of the advance could be sustained."

¹⁰² FM 100-5, p. 118.

¹⁰³ Ibid., p. 125.

¹⁰⁴ Ibid., p. 97. Compare: Lowell L. Limpus, How the Army Fights, (New York: D. Appleton- Century Co., 1943), p.222.

"And that's the way *physical objectives* are selected in the modern attack. There are certain rules governing their selection, which rules are laid down in the military textbooks. Four of these rules are paramount, and their mastery should enable any student to determine just what constitutes an objective and why it was selected. They are as follows:

1. The objective must be within reach of the unit assigned, in the time at its disposal.
2. Its capture should assure the destruction of the enemy unit attacked.
3. It should be a point which can be attacked from several directions at once.
4. It must be easily recognized by the attacking troops."

¹⁰⁵ Ibid., p. 116-7.

¹⁰⁶ Ibid., p. 117.

¹⁰⁷ Ibid., p. 122.

¹⁰⁸ Ibid., p. 123.

¹⁰⁹ Ibid., p. 121.

¹¹⁰ Ibid., p. 124.

¹¹¹ Ibid., p. 125. Compare: FM 17-40, Armored Infantry Company, (Washington: US Government Printing Office, November, 1944), p. 65.

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"59. ASSAULT. The assault is launched either by orders of the platoon leaders or by prearranged signals by the company commander. The riflemen close with the enemy, delivering assaulting fire. The hostile troops are destroyed or driven from their positions by grenades and hand to hand combat. The company commander lifts the supporting fires by a prearranged signal or radio telephone communication. The supporting fires continue their support by firing on adjacent or rearward hostile elements."

¹¹² Ibid., p. 125.

¹¹³ Ibid., p. 126.

¹¹⁴ Ibid., p. 126-7.

¹¹⁵ Douglas A. Macgregor, "Closing With the Enemy," Military Review, February, 1993, p. 69.

¹¹⁶ Gregory Fontenot, "The 'Dreadnoughts' Rip the Saddam Line," Army, January, 1992, p. 36.

¹¹⁷ Michael L. Ryan, "Common Problems Experienced by Task Forces at CMTTC," Memorandum for Commander Operations Group, Combat Maneuver Training Center, 27 February 1991.

¹¹⁸ Ibid., p. (un-numbered), Title: "Maneuver BOS", *Actions on the Objective/Contact not Discussed in Sufficient Detail.

¹¹⁹ Ibid., p. (same), Reference: Note.

¹²⁰ Paul H. Herbert, "Deciding What Has to be Done: General William E. DePuy and the 1976 Edition of FM 100-5," Leavenworth Papers, Number 16, (Ft Leavenworth, KS: US Army Command and General Staff College, July 1988), p. 54-56.

¹²¹ Ibid., p. 55,6.

¹²² Ibid., p. 56. Herbert notes the passage: "9. Cushman, 'Text,' 3-4. At Fort Leavenworth, Cushman outlawed the acronym COCOA as a reminder that one should consider cover, obstacles, concealment, observation and avenues of approach in terrain analysis, 'Anyone who considers himself a tactician and who has to use COCOA to remind himself what to look for is in the wrong line of work,' he declared, implying clearly that tactics is a nearly intuitive art that can only be learned by exposure to many different problems. DePuy would have assumed that most officers needed simple reminders of how to perform routine tasks."

¹²³ FM 71-2, The Tank and Mechanized Infantry Battalion Task Force, (Washington, DC: US Government Printing Office, September, 1988), p. 3-4.

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¹²⁴ Ibid., p. 3-37.

3-18. Assaults and Actions On The Objective: The assault is the overrunning and seizing of an occupied enemy position. The goal of any assault is to destroy the enemy as rapidly as possible with minimum friendly casualties, while physically overrunning or occupying the position.

a. Considerations.

(1) Assaults may be mounted or dismounted. Generally, mounted assaults permit a more rapid operation, while dismounted infantry slows the operation but adds a greater degree of security. The commander determines if, when, and where infantry dismounts based on his analysis of the factors of METT-T and the degree of risk he is willing to accept.

(2) In any assault, the objective must first be isolated by direct and indirect fires.

(3) The unit making the assault is the task force's main effort. As such it receives priority of support.

The manual continues with a discussion of the nature, advantages and disadvantages of both mounted and dismounted assaults.

¹²⁵ FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion/Task Force, and Company/Team, (Washington, DC: US Government Printing Office, September 1992), 3-1 to 3-121.

¹²⁶ Observation Division, Planning, Preparation and Execution of Direct Fire Operations at the National Training Center, (Ft. Irwin, CA: National Training Center, July 1989).

¹²⁷ Ibid., p. (un-numbered).

¹²⁸ Ibid., p. (un-numbered).

¹²⁹ Gulf War Collection, Group Swain Papers, SG Narrative, SG INT-001.

¹³⁰ Compare: FM 100-5, (1941), p. 111 and 121. Author's italics for para. 537.

"502. The action of *combat aviation* in support of ground troops is closely coordinated with the plan of attack. Its first objectives are those hostile elements, the destruction or neutralization of which, will contribute most toward a successful attack. During battle, combat aviation is especially useful as a means, immediately available to a commander, to exploit a success, to correct an adverse situation, to attack reserves or reinforcements or to support ground troops in overcoming unexpected resistance. *Its employment to complement the fire of artillery in a crisis or in fast moving situations is habitual, especially in attacks by tanks and armored forces.*"

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"537. Superiority of fire rests chiefly upon the mutual support of units in the attacking echelon, and the *coordination of their action* with the fire support of artillery, *bombardment aviation* and supporting tanks. It depends not only on volume of fire but also on direction and accuracy."

¹³¹ Lon E. Maggart and G. Fontenot, "Breaching Operations: Implications for Battle Command and Battle Space," Military Review, February 1994, p. 21.

"From the outset, obtaining information on the 26th ID [Iraqi] proved frustrating. While detailed imagery of the division was available, no one seemed able to get it to the tactical units faced with the mission of conducting the attack."

¹³² Gulf War Collection, Group Tait Papers, SG Report, SSG ODSLL-004, Operations Desert Storm, Lessons Learned, Volume IV, Tactical.

¹³³ Ibid., p. IV-5-30. The complete observation follows:

"When it became apparent that allied forces would have to breach a complex obstacle system to retake Kuwait, serious deficiencies in unit training were discovered. Units going to the CTCs had not trained on how to execute a complex obstacle breach; in fact, units at NTC did not have rollers or plows and MICLIC trainers were not being used. The result was a rushed effort to start training units to execute this complex operation and all the resulting organizational and equipment problems associated with it."

¹³⁴ Gregory Fontenot, Oral Interview, (Fort Leavenworth, KS, 21 November, 1994).

¹³⁵ FM 100-5, (1941), p. 97. Compare:

"453. Sound tactical maneuver in the offense is characterized by a concentration of effort in a direction where success will insure the attainment of the objective. On the remainder of the front are used only the minimum means necessary to deceive the enemy and to hinder his maneuver to oppose the main attack. "

¹³⁶ Ibid., p. IV-1-1.

¹³⁷ Robert H. Scales, Certain Victory, (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994), p.293.

¹³⁸ Fontenot, Oral Interview.

¹³⁹ USAARMS Desert Shield/Storm Lessons Learned Update, Fort Knox, KY, 2 April 1991.

¹⁴⁰ Craig Gephart, Actions on the Objective, FORSCOM Leaders Training Program (FLTP), (Ft. Irwin, CA: National Training Center, August 1992).

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¹⁴¹ Ibid., p. intro.

¹⁴² Ibid., p. 1.

¹⁴³ Ibid., p. 2.

¹⁴⁴ USAARMS, "- 197th Bde is not normally configured with combined arms battalion - they are pure, but they task organized early in SWA and established relationships, and conducted drills and training in preparation for combat.

-Conducted extensive, detailed MAPEXS, rehearsal and drills."

¹⁴⁵ Fontenot, 'Dreadnoughts', p.33.

¹⁴⁶ Fontenot, Interview.

¹⁴⁷ Vinci, Leonardo da, as quoted by J.F.C. Fuller, The Foundations of the Science of War. London: Hutchinson & Co. Ltd. 1926. p. 33.

¹⁴⁸ J. H. Binford Peay III, "Building America's Power-Projection Army," Military Review, July 1994, p. 8.

¹⁴⁹ Ibid., p. 6.

¹⁵⁰ Myron J. Griswold*, "Focusing Combat Power: Seeing is Winning," Military Review, July 1994, p. 70.

¹⁵¹ Howard, "Military Science in an Age of Peace."

¹⁵² FM 100-5, Operations, (1993), p. 1-1.

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